

Pollution (The) of water-supplies



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THE POLLUTION OF WATER-SUPPLIES.

DR. CHARLES SMART, Surgeon U. S. A., presented a report at the recent meeting of the American Public Health Association on the pollution of water-supplies.

The report gives special emphasis to the conclusion reached at the previous meeting, that, when there is sewage in a water-supply, there is danger of typhoid infection. Some of the evidence is briefly cited; and financial interests involved are held responsible for the hesitancy to acknowledge this specific danger, for as soon as a city relieves itself from the oppression of the moneyed interests, and procures a wholesome water for its citizens, it immediately recognizes the connection between sewage and typhoid. Vienna recognized this connection when it found that, by substituting the water of a mountain-stream for the sewage-water of the Danube, its annual deaths from typhoid fell from three hundred and forty to fifty, and shortly afterwards to eleven, in every hundred thousand of the population; and an improved sewage system had nothing to do with this, as the sewage system was in existence during the period of high typhoid rates.

The efforts made by municipal authorities and water companies are then passed in review. The advantages of sedimentation, which is the method generally adopted in this country, are recognized, and particularly when sedimentation is prompted by the use of precipitants, such as chloride of iron, as recently suggested by L. H. Gardner, of New Orleans, La. The changes that take place during storage are held to be purifying in their nature, notwithstanding the vast increase in the number of bacteria developed in the stored waters. The slowness of the sedimenting process, often necessitating a large expenditure for storage-basins, has led to the experimental use of such filtering beds as are employed so generally for municipal supplies in England; but the expense attending them is large, and the coldness of our winters begets difficulties which are not encountered in the milder climate of England. Attention is then directed to the patent filters that have of late been manufactured for use on a large scale. Their ability to furnish a clear water is conceded; but the object of the filtration of a water-supply for domestic or public service is its wholesomeness when used for drinking, and its transparency gives no testimony on this point. Artificial filtration has neither the time nor the surface to effect percolation after nature's methods. In these artificial filters, as much water is transmitted under pressure in half an hour as nature purifies on the same area annually. Bacteria of nitrification, which effect the purification during the passage of a water through the soil, cannot be harnessed to the work of the artificial filter. Artificial filtration consists of the mechanical separation of a water from its suspended impurities, while the essential of natural filtration is the thorough nitrification of the dissolved albuminoids of the water, the removal of the suspended matters being incidental and merely secondary.

But although sedimentation and filtration give a more or less clear water, and one in which the organic matters that are prone to decompose are destroyed and rendered harmless by bacterial agencies, if an infected sewage has entered the water, the living germs of typhoid fever are not removed or deprived of their virulence by any of these modes of purification. The infected water which prostrated twelve hundred of the eight thousand inhabitants of Plymouth, Penn., and killed a hundred and thirty of those whom it prostrated, passed through three storage-reservoirs on its way to accomplish its deadly mission; and the springs of Lauzun, in Switzerland, contained the germs and propagated the disease, although their waters had undergone a thorough filtration. From the particulars of the latter epidemic, it is held, that, while sewage irrigation may give effluents that will preserve our streams from becoming open sewers, it will never furnish a water which can be afterwards used as a drinking-supply.

The conclusion reached is an emphasized reiteration of that of every committee which has investigated this subject,—that a water to which sewage has had access should, from that fact alone, be excluded from all further consideration as a possible water-supply for domestic purposes. Money is held to be all that is wanting to solve the question of pure water-supplies. Engineering difficulties fall into insignificance when surveyed from a satisfactory financial standpoint. It is often said to be beyond the power of money to purchase health, but the sanitary student can readily demonstrate that in many cases this is not so. Money expended in the distribution of a wholesome water-supply will purchase health for the thousands who otherwise fall victims to the fever which is endemic in our cities and towns. * * * * * * * * *

The germ of disease may not be in this pitcherful or in that, in this tumblerful or in that, but it will find us some day, if we continue to use the water which contains it. In a town of fifty thousand inhabitants, one victim is taken daily; and, as the average duration of this fever is about a month, there are always in that city thirty persons whose lives are unnecessary trembling in the balance. What is the local suffering from yellow-fever in Jacksonville, Pensacola, or New Orleans, once in so many years, compared with the totality of the devastation caused by the steady progress of this general and ever-present scourge? Thirty thousand people die of typhoid fever annually in the United States of America; and Vienna lowered her losses by this fever from three hundred and forty to eleven annually in every hundred thousand of her population, by introducing a spring-water supply instead of the sewage-tainted waters of the Danube. Calculate the loss by sickness associated with these thirty thousand deaths,—the loss of work, the unprofitable work of nursing, and the actual outlay necessitated by each visitation of the disease,—and you will find that saving money by drinking sewage in the water-supply is a penny-wise policy, that, in the long-run, will fail to pay even for the funerals and mourning goods.

The importance of acting promptly is insisted upon, as the longer a community procrastinates, the greater is the difficulty experienced in procuring a desirable supply of water, owing to the increasing density of the population of the surrounding country.